CLAIMS

1. Method of position determination in a radio system, the method comprising correlating (Step 1) a signal (R(t)) received at a unit (1) with a replica signal at the unit, and processing (Step 2) the correlated signal with an optimisation function comprising an exponential term in combination with a second term.

2. A method according to Claim 1 wherein the exponential term is in the form $Be^{-\alpha t}$ (Step 2).

3. A method according to Claim 1 or 2 wherein the second term is of the form:

$$\tau_o\sqrt{(1-\frac{\tau_{o^2}}{t^2})}$$

(Step 2).

4. A method according to any preceding claim comprising effecting an integration (Step 3) with the replica signal.

5. A method according to any preceding claim comprising fitting the optimisation function and a Line-of Sight correlation function (Step 4) with a set of parameters.

6. A method according to Claim 5 comprising superposing the diffuse correlation output with a Line-of-Sight function output and fitting with correlation data of known values for the Line-of-Sight output.

7. A method according to any preceding claim comprising first operating a multipath mitigation technique to effect correlation of the received and replica signals.

PCT/IB2004/051845

8. A method according to Claim 5 wherein the multipath mitigation technique comprises a Multipath Estimating Delay Locks Loop (MEDLL) technique (Step 1).

9. A method according to Claim 5 wherein the multipath mitigation technique comprises a Minimum Mean Square Error (MMSE) technique.

10. A computer program product directly loadable into the internal memory of a digital computer, comprising software code portions for performing the method of any one or more of Claims 1 to 9 when said product is run on a computer.

11. A computer program directly loadable into the internal memory of a digital computer, comprising software code portions for performing the method of any one or more of Claims 1 to 9 when said program is run on a computer.

12. A carrier, which may comprise electronic signals, for a computer program of Claim 11.

13. Electronic distribution of a computer program product of Claim 10 or a computer program of Claim 11 or a carrier of Claim 12.

14. Apparatus for position determination of a radio system, the apparatus comprising means to correlate (13) a signal (R(t)) received at a unit (1) with a replica signal at the unit, and means (13) to process the correlated signal with an optimisation function comprising an exponential term in combination with a second term.

15. Apparatus according to Claim 14 wherein the exponential term is in the form $Be^{-\alpha t}$.

16. Apparatus according to Claim 14 or 15 wherein the second term is of the form:

$$\tau_o\sqrt{(1-\frac{\tau_{o^2}}{t^2})}.$$

17. Apparatus method according to any of Claims 14 to 16 comprising means (15) to effect an integration with the replica signal.

18. Apparatus according to any of Claims 14 to 17 comprising means (15) to fit the optimisation function and a Line-of Sight correlation function with a set of parameters.

19. Apparatus according to Claim 18 comprising means (15) to superpose the diffuse correlation output with a Line-of-Sight function output and fit with correlation data of known values for the Line-of-Sight output.

20. Apparatus according to any of Claims 14 to 19 comprising means to first operate a multipath mitigation technique to effect correlation of the received (R(t)) and replica signals.

21. Apparatus according to Claim 20 wherein the multipath mitigation technique comprises a Multipath Estimating Delay Locks Loop (MEDLL) technique.

22. Apparatus according to Claim 20 wherein the multipath mitigation technique comprises a Minimum Mean Square Error (MMSE) technique.